



UNITED STATES PATENT AND TRADEMARK OFFICE

lin

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/690,607

10/23/2003

Tsuyoshi Maeda

117304

6772

25944 7590 04/18/2007
OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER

SCHECHTER, ANDREW M

ART UNIT

PAPER NUMBER

2871

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
--	-----------	---------------

3 MONTHS

04/18/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/690,607

Applicant(s)

MAEDA, TSUYOSHI

Examiner

Andrew Schechter

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,7,22,23,29-31,34-37 and 40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,7,22,23,29-31,34-37 and 40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Request for Continued Examination

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 26 January 2007 has been entered.

Response to Arguments

2. Applicant's arguments filed 26 January 2007 have been fully considered but they are not persuasive.

The applicant argues [p. 6-7] that *Jisaki's* disclosure of a $\lambda/4$ plate does not satisfy the limitation that $R(450)/R(590) < 1$, as recited in the amended claim 1. In particular, the applicant acknowledges that for an ideal $\lambda/4$ plate, for which the retardation at each wavelength was exactly $1/4$ of the wavelength, the retardation at 450nm would be less than the retardation at 590nm, so the inequality would be met. However, the applicant asserts that *Jisaki's* $\lambda/4$ plate is not an ideal one and presents a graph which shows "Optical characteristics of retardation plates"; from this they conclude that since *Jisaki's* plates are "the well-known type that need to be used with $2/\lambda$ [sic] plates, the ratio $R(450)/R(590)$ is greater than 1." This is not persuasive.

First, it is unclear to the examiner where the provided graph comes from, or on what basis the applicant asserts that it represents properties of *Jisaki's* $\lambda/4$ plate. In general, attorney arguments cannot take the place of evidence [see MPEP 716.01(c) and MPEP 2145]. Second, there are several informalities related to the graph: the repeated references to " $2/\lambda$ " and " $4/\lambda$ " plates rather than " $\lambda/2$ " and " $\lambda/4$ " plates, and the vertical axis marked as " $\Delta n d/\lambda$ " while the scale is labeled " $0, \lambda/4, \lambda/2$ ". Also, the graph does not explicitly compare $R(450)$ with $R(590)$ [instead the graph plots $R(450)/450$ and $R(590)/590$], so it is not trivial to determine that their ratio is indeed less than 1. Third, *Jisaki* explicitly states that their $\lambda/4$ plate is "a wide-band $\lambda/4$ film.... which satisfies the $\lambda/4$ condition in a wide band" [col. 7, lines 44-50] and " $\lambda/4$ retardation films 8 and 9 both have phases [sic] differences of $\lambda/4$ in the visible wavelength region" [col. 8, lines 57-63]; therefore, there is an explicit statement in the *Jisaki* reference that its $\lambda/4$ plate does act as a (nearly) ideal $\lambda/4$ plate, contradicting the applicant's assertion. Finally, while there appears to be no explicit support in *Jisaki* that retardation films 1 and 4 are $\lambda/2$ films used to improve the uniformity of the optical characteristics as shown in the applicant's graph, even assuming that this were the case it does not appear sufficient to establish patentability of the present claims. At worst, *Jisaki* would be disclosing a two-layer nearly-ideal $\lambda/4$ plate rather than a one-layer nearly-ideal $\lambda/4$ plate, which would presumably have optical characteristics like the "Combination" line shown on the applicant's graph; this would read on the present claim language and would also tend to make obvious to one of ordinary skill in the art at the time of the invention the use of a single-layer nearly-idea $\lambda/4$ plate.

Art Unit: 2871

The previous rejections are therefore maintained, modified as necessary by the amendments to the claims.

Claim Objections

3. Claims 1 and 40 are objected to because of the following informalities: in each claim, " $(nx1+ny1)/2-nz1 \times d1$ " in the inequality should be " $((nx1+ny1)/2-nz1) \times d1$ " [note the missing parentheses]. Appropriate correction is required.
4. Claim 40 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The limitation of claim 40 has been put into the amended claim 1.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 7, 22, 23, 29, 30, 34-37, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Jisaki et al.*, U.S. Patent No. 6,753,939 in view of *Yano et al.*, U.S. Patent Publication No. 2002/0071070, in view of *Terashita et al.*, U.S. Patent No. 6,201,592.

Jisaki discloses [see Fig. 1, for instance] a liquid crystal display device comprising a liquid crystal layer [3] between a first substrate [1] and a second substrate [2], one dot [one pixel] including a reflective display region [5] and a transmissive display region [6], the liquid crystal layer include a nematic liquid crystal [see Fig. 2] having negative permittivity anisotropy oriented substantially perpendicularly to the substrates [col. 6, line 61 – col. 7, line 20], a first retardation film [8] and a first polarizer [10] disposed in this order on the outer side of the first substrate, a second retardation film [9], a second polarizer [11] and an illuminating device [12] being disposed in this order on the outer side of the second substrate, and at least one of the first retardation film and the second retardation film having optical biaxiality [col. 8, line 65]. *Jisaki* discloses that the polarizers linearly polarize light and the retardation films convert the linear polarized light to circularly polarized light [col. 8, lines 15-30, for instance].

Jisaki discloses optical biaxiality, but does not explicitly disclose that the sum $W1$ satisfies $0.5xRt \leq W1 \leq 0.75xRt$, and that $n_{x1} > n_{y1} > n_{z1}$ and $n_{x2} > n_{y2} > n_{z2}$, as recited in the last paragraph of claim 1.

On the first point, *Yano* discloses [see paragraph 0028, etc.] the use of retardation films satisfying $n_x \approx n_y > n_z$, and teaches that such optical devices should have a sum $W1$ for their out-of-plane (thicknesswise) retardations satisfying $0.5xRt \leq W1 \leq 1.3xRt$, or more preferably $0.7xRt \leq W1 \leq 1.0xRt$, ranges which overlap the recited range. In such cases of overlapping ranges, a *prima facie* case of obviousness exists [see MPEP 2144.05]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the sum $W1$ within the recited range, motivated by the

Art Unit: 2871

teaching of *Yano* that this is preferred in order to achieve a wide viewing angle through higher-grade compensation [see paragraph 0028, etc.].

On the second point, *Yano* teaches this range in the context of retardation films which satisfy $n_x \approx n_y > n_z$ rather than $n_x > n_y > n_z$. First, in order to convert linear to circular polarized light as *Jisaki's* retardation films do, it is necessary to have an in-plane retardation difference, or $n_x > n_y$. Second, as far as the out-of-plane (thicknesswise) retardation is concerned, *Terashita* [col. 18, lines 20-55] is evidence that it is an art-recognized equivalent for retardation films to have either $n_x \approx n_y > n_z$ or $n_x > n_y > n_z$, with either providing compensation for the viewing angle dependency problem. It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use retardation films with $n_x > n_y > n_z$ and the recited retardation ranges, motivated by the desire to have appropriate in-plane retardation (for conversion of the light polarization) and out-of-plane retardation (for higher-grade compensation for viewing angle dependence).

Claim 1 also recites that the retardation of the first film satisfies $0.5xR_r \leq \text{Ret\#1} \leq 0.75xR_r$, where R_r is the retardation in the reflective region. Since the reflection region has thickness d in *Jisaki* and the transmissive region has thickness $2d$, the retardation in the reflection region is half that in the transmissive region, so we have $R_r = \frac{1}{2}R_t$. We also have $\text{Ret\#1} = \frac{1}{2}W_1$. This means that $0.5xR_t \leq W_1 \leq 0.75xR_t$ is equivalent to $0.5xR_r \leq \text{Ret\#1} \leq 0.75xR_r$ for the transflective device of *Jisaki*, so this limitation is met as discussed above.

The retardation films are $\lambda/4$ plates in the visible wavelength range [see col. 7, lines 44-50 and col. 8, lines 57-63], so $R(450) / R(590)$ is smaller than 1.

Claim 1 is therefore unpatentable.

The thickness of the liquid crystal layer in the reflective display region is smaller than the thickness in the transmissive region [see Fig. 1], so claim 7 is also unpatentable. The polarizers are orthogonal [col. 8, lines 30-31], so claim 22 is also unpatentable. The phase difference values of the first and second retardation film are substantially equal [col. 8, lines 50-54], so claim 23 is also unpatentable. There is a reflection layer [25], having an irregular configuration for performing scattered reflection [see Fig. 4], so claims 29 and 30 are unpatentable. There is a protuberance [13] formed on an electrode formed on the inner surface of one of the substrates, adjacent the liquid crystal, so claim 35 is also unpatentable. There can instead be an electrode having an opening [50, see Fig. 16] to drive the liquid crystal, on the inner surface of one of the substrates, adjacent the liquid crystal, so claim 34 is also unpatentable. There are at least two liquid crystal directors in one dot [pixel] when the liquid crystal is driven by an electrode [see Fig. 2], so claim 36 is also unpatentable. This is electronic equipment, so claim 37 is also unpatentable. The inequality recited in claim 40 is the same as that discussed above, so claim 40 is also unpatentable.

7. Claims 1, 22, 29-31, 37, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kubo et al.*, US 2001/0055082 in view of *Jisaki et al.*, U.S. Patent No. 6,753,939 in view of *Yano et al.*, U.S. Patent Publication No. 2002/0071070, in view of *Terashita et al.*, U.S. Patent No. 6,201,592.

Kubo discloses [see Figs. 13 and 15, for instance] a liquid crystal display device comprising a liquid crystal layer [5] between substrates, with reflective and transmissive display regions, nematic liquid crystal having negative permittivity anisotropy oriented substantially perpendicularly [see Fig. 15 and discussion thereof], a first retardation film [7] and first polarizer [6] in this order, a second retardation film [10] and a second polarizer [9], and an illuminating device [see Fig. 13] in this order. The retardation plates convert linear to circular polarization [see paragraph 0027, for instance].

Kubo does not disclose that at least one of the retardation films has optical biaxiality; it appears that the retardation films are both uniaxial. *Jisaki* discloses, for an analogous device, using either uniaxial or biaxial retardation films [col. 8, lines 64-65]. This is evidence that optical uniaxiality and biaxiality are considered art-recognized equivalents in this specific context; it would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use biaxial films in the device of *Kubo*, motivated by the art-recognized equivalence of the two. Satisfying the additional limitation regarding $n_x > n_y > n_z$, $W1$, $Ret\#1$ (with $R_r = \frac{1}{2}R_t$, $d_r = \frac{1}{2}d_t$), and $R(450)/R(590) < 1$ (due to the $\lambda/4$ plate) would have been obvious to one of ordinary skill in the art at the time of the invention in view of *Yano* and *Terashita* as discussed above.

Claim 1 is therefore unpatentable.

Kubo discloses crossed polarizers, so claim 22 is also unpatentable. *Kubo* discloses an irregular reflection layer, so claims 29 and 30 are also unpatentable. *Kubo* discloses that the retardation films are orthogonal to each other in the X-axis direction, and form 45° angles with respect to the polarizers [see Fig. 15], so claim 31 is

Art Unit: 2871

also unpatentable. *Kubo* discloses electronic equipment, so claim 37 is also unpatentable. Claim 40 repeats a limitation in claim 1, so it is also unpatentable.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

Art Unit: 2871

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Andrew Schechter
Primary Examiner
Technology Center 2800
14 April 2007